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that purpose, two Government forestry organizations were merged into the Forest Service under the Department of Agriculture.

To throw open those carefully guarded reserves, now known as National Forests, 734 employees of the service went to work, slashing roads through wildernesses, selecting trees for harvest, studying claims of ranchers who wanted to graze herds on rangelands within the forests. Rangers became salesmen, marketing standing timber to logging companies. Instead of being left to crumble away uselessly, forest giants felt the bite of the ax and were trundled off to mills, earning money and making room for younger trees to mature.

With laborious spade work, men hand-planted thousands of seedlings in barren areas—trees that would protect watersheds by trapping rainfall and letting it seep into the ground instead of running off in deep, soil-destroying gullies. Cattlemen who were sold permits for grazing found the Government-owned pastures perennially rich because rangers controlled the number of stock and occasionally reseeded grasslands. Hunters and fishermen were welcomed to Government forests that still contain a third of all the big game in the United States. The service adjusted open seasons so that wildlife population constantly renewed itself.

In early days, as now, fire was a vicious enemy. In 1910, 4,000,000 acres went up in smoke, destroying 16 billion board feet of timber and killing 78 men. New fire-fighting equipment, including planes, helicopters, and specially trained parachutists, aid today's war against flames, but the

Grazing Ranges Like This Add to Forest Service Income. Cattlemen Buy Permits While Rangers Control Number of Stock. Service Has Reseeded Over 200,000 Acres

U. S. FOREST SERVICE

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Forest Service: 50 Years of Land Management

U. S. FOREST SERVICE

In 1909 when this picture of Forest Rangers was taken, many Westerners thought such Government "dudes" were intent on stunting the growth of the West. The tracts of woodland these fire-spotters guarded were unsettled. Would-be homesteaders wanted to move in and clear off the trees to make room for cattle or crops.

In 1955, half a century after the birth of the United States Forest Service, public feeling has swung around. Rangers have won a reputation as land managers, not just custodians of untouchable areas. Their neighbors respect them as specialists in profitable use of land.

During its first year, 1905, the service earned $75,000 for the Government, mostly from the sale of timber on 56,000,000 acres of National Forests. Last year, Government receipts totaled nearly $70,000,000 from 180,000,000 acres. Though many a small boy still wants to wear a ranger's green uniform when he grows up, the job involves less glamor than in its early years, more hard-headed business sense. Part teacher, part scientist, part policeman, the modern ranger is above all a technician. His main job: to get the maximum benefit to the nation out of 151 National Forests in 39 States, Alaska, and Puerto Rico.

This concept of "use" was a new definition for "conservation" back in 1905. To stop the steady drain of American timber resources, the Government had already set aside forest reserves on which logging, grazing, even hunting and fishing were forbidden. But President Teddy Roosevelt and young forestry experts like Gifford Pinchot, Bernard E. Fernow, Henry S. Graves, and William B. Greeley wanted these forests to be managed "for the greatest good of the greatest number in the long run." To fulfill

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Midnight Sun Brings Summer Guests to Norway

Few people are as enthusiastic about wide-open spaces as citizens of the Land of the Midnight Sun. When snow whitens the landscape from skerry to inland peaks that spike three quarters of their nation, Norwegians in droves take to ski slopes and frozen lakes.

But from the first drop of a melting icicle until bonfires mark Midsummer Eve, Norway hums with preparations for overseas visitors. This year Norwegians expect more tourists than ever before. Every city and fishing village is sprucing up for their welcome.

From Hammerfest, Europe's most northerly town, where a youth hostel is being built, down past Mandal at Norway's southmost curve, along deep fringes of the fjord-gashed coast to the capital, Oslo, new hotels are springing up, old ones being refurbished. Vessels from passenger steamers to dinghies are up for overhaul in this land where rugged inland terrain explains a long seafaring history.

Knitting needles are clicking on socks and sweaters in the gay patterns so popular on winter playgrounds in England and America. Craftsmen are speeding work on carved wooden toys and silver jewelry.

A third of Norway's area, which totals twice the size of New England, lies above the Arctic Circle, where, at Midsummer, the sun never slips below the horizon. Flying excursions from Oslo take tourists to the arctic town of Bodø to watch the midnight sun.

Northerly as the nation is, the Gulf Stream warms its shore line and carries fish to furnish one of the country's leading industries. Landing at Stavanger's international airport near the coast's south curve, visitors may watch pretty girls neatly placing sardines in cans on assembly lines that in other seasons are used to tin fruits and vegetables.

Norway's cataracts, plunging down steep gorges that cut between

Tied up at Its Sandefjord Mooring, a Whaling Flotilla Rests from Its Chores

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modern Forest Ranger remains as vigilant as the smoke-spotters of 1909.

Through the years education has played an increasingly important role in the Forest Service. Rangers offer advice on forest management to private tree farmers, big and small. They answer questions from among millions of visitors who use 4,500 camp and picnic grounds within the National Forests. With publicity devices like Smokey "the fire preventin' bear" they alert the public to fire danger.

There is still adventure, too, in the ranger's life. In winter, as a Snow Ranger, he guards lives and limbs of skiers, standing by with rescue toboggan and first aid kit, testing snow depth and texture to determine avalanche danger. Snow Rangers relieve dangerous snow pressure by deliberately causing snow slides—sometimes with artillery shells lobbed onto the slope, sometimes by the hair-raising expedient of skiing across an overhang, slicing it away with ski edges.

Looking ahead, the 50-year-old Forest Service faces new problems. For example, insects and disease actually destroy more trees than fire. Already the service's research laboratories are battling these plagues, often enlisting other organizations in the fight. When bark beetle or leaf-eating insects strike, low-flying planes spew a deadly haze of spray over afflicted trees. When white pine blister rust is spotted, rangers can control its spread by cutting fungus-carrying currant and gooseberry bushes from around the trees. As new blights appear, the Forest Service must arm to combat them.

U. S. FOREST SERVICE

Trained at Missoula, Montana, the Forest Service's crack "smoke-jumpers" can reach fires raging deep in inaccessible regions. Men wear football helmets, baseball masks to protect faces against trees. Smoke-jumpers instructed the Army's paratroops during World War II.

References—*National Geographic Magazine*, Nov., 1952, "From Sagebrush to Roses on the Columbia"; Nov., 1949, "Sno-Cats Mechanize Oregon Snow Survey"; July, 1946, "Forest Lookout"; GEOGRAPHIC SCHOOL BULLETINS, March 21, 1955, "Tree Farmers Say, 'Keep Them Growing'"; Nov. 24, 1952, "Weapons of Science Fight Forest Fires." *School and library discount price for Magazine issues a year old or less, 50¢; through 1946, 65¢. Write for prices of earlier issues.*

500 years before Columbus made his first voyage to the West Indies.

The Viking spirit of adventure and exploration lingers in Norway. On June 19 Tromsø will celebrate Polar Day in honor of its most famous citizen, Roald Amundsen. An arctic procession will pass through the streets, past the great explorer's statue. In 1911, Amundsen became the first man to set foot on the South Pole.

Norway's scenery is one of its most precious assets—certainly during the tourist season. The fjords—deep, elongated bays—knife between steep mountains, sometimes as much as 50 to 100 miles from their ocean mouths. Their scenic combination of rich blue water and jagged, rock-crested peaks partly explains the horde of visitors. There are other causes, too: 150,000 islands for yachtsmen to explore, delicious food, and above all, warm native hospitality.

Among the summer visitors to the land of the Vikings will be Queen Elizabeth II of England and the Duke of Edinburgh who will sail into Oslo Fjord June 24 on the royal yacht *Britannia* for a three-day visit to the land of their cousins. The queen, the duke, and Crown Prince Olav of Norway all are descendants of Queen Victoria.

References—Norway is shown on the National Geographic Society's map of Northern Europe. Write the Society, Washington 6, D. C., for publication order list. *National Geographic Magazine*, Aug., 1954, "Stop-and-Go Sail Around South Norway"; Nov., 1953, "Native's Return to Norway"; Nov., 1950, "Baltic Cruise of the *Caribbee*"; Aug., 1948, "Norway Cracks Her Mountain Shell"; April, 1939, "Country Life in Norway"; GEOGRAPHIC SCHOOL BULLETINS, Nov. 9, 1953, "Indian Chief in Line for Norway's Throne"; Feb. 11, 1952, "Oslo Plays Host to Winter Olympics."

Busy Shoppers Jostle in the Heart of Oslo, Norway's Capital and Chief Port

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Residents Rebuilt Ulvik on Hardanger Fjord, Destroyed by Germans in World War II

mountain ranges, supply electric power to compensate for the lack of coal. Most industry and most population lie along the coasts, nourished by thriving ocean trade. At Bergen this summer an exhibition showing what the sea has meant to Norway will depict the nation's history from Stone Age to present day. Sight-seers will also marvel at medieval waterfront buildings that once held cargoes of Hanseatic trading cities. These contrast dramatically with ultramodern hotels and restaurants. Bergen's International Festival will honor the noted composer, Edvard Grieg, long a resident of this city which boasts a 12th-century cathedral and a Stone Age cave—the oldest homestead in Scandinavia.

Oslo's open-air museum includes old timber houses from all parts of the country set up in surroundings that resemble their original sites. A stave church, Oriental-style structure dating from the 11th or 12th century, also stands in the parklike museum. Its sharp gables are adorned with dragon heads, akin to the figureheads on Viking ships that plowed across the North Atlantic to reach America perhaps

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A hay shock sent skimming down from harvest fields by cableway is unhooked by a Norwegian farm girl.

In Sparta youths learned little reading and writing. When they were seven years old, Spartan boys were taken from their parents. A stern governor, or *paidonomos*, brought them up in barracks. From the time they were twelve, they were allowed only one garment, winter and summer. They made their own bedding from Eurotas River rushes and learned military exercises in preference to athletic sports.

But most city-states followed in the footsteps of Athens. There houses of sun-dried brick lined narrow winding streets. Slender dark-haired women, dressed in loose-fitting wool shawls, drew water from fountain houses, balancing heavy jugs gracefully on their heads. Their families ate two meals a day, usually bread, fish, or cheese, and perhaps broth of beans. Honey took the place of sugar.

A brazier or dish of burning charcoal provided the home's only heat. There was no chimney; smoke from the stove in the tiny kitchen sometimes smudged the walls instead of curling through a small hole cut in the roof. In Athens homes women wove wool and linen on hand looms much as they do today. Servant girls helped their mistresses apply powder and rouge; eyes were darkened with mascara by Greek beauties who used creams and beauty lotions.

In groves near Athens workers gathered olives and squeezed out oil on crude stone presses—one of the major industries of ancient Greece. Athenian oil in clay jars found its way to many Mediterranean ports as Greek merchantmen ventured through the Greek islands and westward to Sicily. Fishing boats, too, skimmed into the island maze, returning with sardines, tunny, eels, herring, octopuses. Merchants announced fresh shipments by ringing a "fish bell," signaling householders to hurry to market for the best choice. For hundreds of years Athenian custom dictated that only the master of the house, accompanied by a slave, do the marketing. Women had no part in it.

FROM A PAINTING BY H. M. HERGET, © NGS

Greeks taught the world to play. Their great games—the first Olympics—included jumping, discus throwing, running, wrestling, and boxing. The games were so important that Greeks measured time by Olympiads, four-year intervals between Olympics. Athletic victors won

The man who conquered the world greets Diogenes, content to sleep in a tub. Alexander the Great offered to grant any wish. The philosopher's request: "Stand to one side and not keep the sun off me." Diogenes carried a lantern at midday, looking for "an honest man."

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Cradles of Civilization, No. 3: Greece

The gleaming bronze statue of Athena Promachos, Greek goddess who fought in the forefront of battle, looks down on a slow, solemn procession of citizens bringing gifts to another Athena, guardian goddess of Athens. Their chief mission: to present a new robe, woven by women and girls of the city, to their patroness, favorite child of the god Zeus.

Soon the gift bearers will pass before the 45-foot-tall statue of Athena, sculptured by Pheidias. He carved her face and arms in ivory. Her helmet, cloak, and shield he made from more than a ton of gold worth $6,000,000.

Athena's likeness dominated a huge marble temple, the Parthenon. Today the Greek government is restoring the ancient shrine, greatest building achievement of the golden age of Athens 2,500 years ago.

Many centuries before, waves of nomadic invaders—Greeks who called themselves Hellenes after the legendary Hellen—swept down from the north through the Balkans and mingled with the early inhabitants. Communities soon dotted tiny islands or land strips cut by mountain spurs running down to the sea. Farmers, then as now, scratched a living from small rocky fields tucked among the hills.

Great independent city-states sprang up—Sparta, Athens, Thebes, Argos, and others—rivals until foreign armies attacked. Athenians made their city a center of culture; warlike Sparta excelled as a military state. Athens boys learned reading, writing, arithmetic, music, rhetoric, and philosophy in simple, almost bare school buildings. They wrote on waxed tablets much like slates American boys and girls once used. On playing fields they practiced gymnastics.

known physician of his time, laid the foundations of modern medicine. Today's physicians still take the Hippocratic Oath.

The Greek theater handed down theatrical terms like scene, chorus, drama, tragedy, and comedy. Aeschylus and Sophocles wrote the first tragedies; Aristophanes produced the first comedy.

Peace ended abruptly. Sparta, incited by Persian gold, attacked rival Athens in 431 B.C. in a ruinous 30 years' war that left both city-states exhausted. Already weakened, Athenians failed miserably in an expedition to Sicily in 415 B.C. Sparta eventually assumed control of the Greek states, only to be overthrown by Thebes.

Even in troubled times, Athenian philosophers Socrates, Plato, and Aristotle wrote and taught; Euripides succeeded Sophocles in drama.

Macedonia, a growing power to the north, led by Philip, swept away weak Greek resistance and made the defeated states part of the Macedonian empire. Philip's son, Alexander the Great, put down Greek revolts but treated his subjects leniently. He crossed the Hellespont, now called the Dardanelles, in 334 B.C. and defeated Persia's Darius III, to place the century-old enemy of Greece in the Macedonian empire.

But imperial Roman soldiers overthrew the Macedonians. In 146 B.C., the last Greek city, Corinth, fell. Romans used Greek teachings to develop engineering and a legal system in their new empire. ***Next week: Rome***

References—Ancient Greece is featured on the Society's map, Classical Lands of the Mediterranean. *Everyday Life in Ancient Times*, Society's 368-page book lavishly illustrated with H. M. Herget's full-color documentary paintings (U. S. $5.00; elsewhere $5.25), includes three articles on Greece from March, 1944, *National Geographic Magazine* (out of print); March, 1940, *Magazine*, "Modern Odyssey in Classical Lands"; GEOGRAPHIC SCHOOL BULLETINS, Feb. 9, 1953, "Greece's Delphic Oracle Always 'Knew Best'."

Greeks Were Seafarers. Fruit- and Oil-Laden Merchantmen Supplied Mediterranean Ports. Bronze-Bowed Athenian Warships Defeated Persian Invaders at Salamis.

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great distinctions; they were permitted to set up statues of themselves in the sacred precinct of Olympia. Poets sang their praises in lyric verse. Some cities supported them at public cost for the rest of their lives.

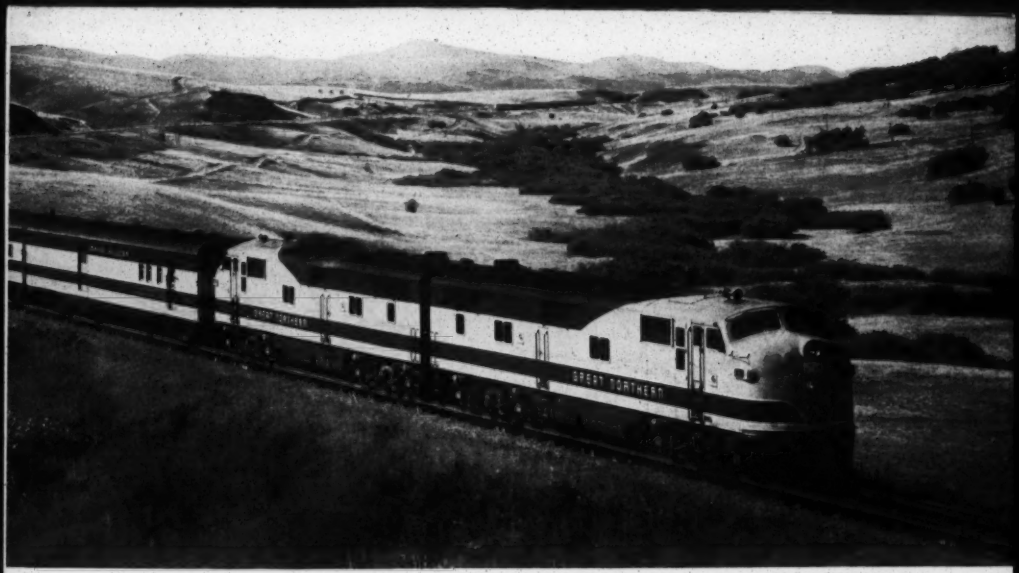
By the end of the fifth century B.C., Athens emerged a democracy —first in the history of the world. Every citizen had an equal vote in state business. Still Greece remained a land of disunited, rivalrous city-states.

In the summer of 480 B.C. Persian King Xerxes, whose father had been defeated at Marathon a decade earlier, moved down with a vast army against Greece. City-states forgot their differences and joined forces. Persians overcame the valiant Greek army of Spartan King Leonidas at Thermopylae and stormed the Acropolis at Athens, leaving the city in blackened ruins. But an out-manned Athenian fleet bottled up attacking Persian warships near the island of Salamís. Massive Persian galleys, lacking sea room to deploy, were at the mercy of Greek vessels that rammed their bronze-beaked bows into the enemy's hulls. Victory at Salamís saved the day and made Athens mistress of the seas.

In his famous center of healing, Hippocrates, father of medicine, treats the child of a young Athenian mother in Greece's golden age some 2,500 years ago. Even then women in rich-colored *chitons* (left) used powder, rouge, lipstick, mascara, and beauty lotions much as they do in the 20th century.

FROM PAINTINGS BY H. M. HERGET, © NGS

The next half century was Athens's golden age. Herodotus, called the father of history, came to Athens to write the first geography book, which told of his travels in Egypt, Cyrene, Babylon, and Susa, capital of Persia. His contemporary, Hippocrates, best-



GREAT NORTHERN RAILWAY

Rudolf Diesel Packaged Heavy-Duty Power

On the night of September 29, 1913, a 55-year-old German inventor boarded an English Channel steamer at Antwerp, Belgium. He was headed for a conference in London dealing with his engine—the most efficient the world had ever seen. He never reached England's shore.

That was the mysterious end of Rudolf Diesel whose engine, today, powers tractors, trucks, tanks, ships, earth-moving equipment, and has almost entirely replaced steam locomotives on United States railroads.

Unlike a gasoline engine, the Diesel uses no spark plugs to ignite its fuel. Instead, the up-stroke of the Diesel piston compresses air until it reaches a temperature of about 1,000 degrees Fahrenheit—hot enough to explode a jet of fuel forced into the cylinder. Usually the fuel is crude oil, though one of the first Diesels ran on coal dust. The Diesel is comparatively inexpensive to run and extremely efficient in converting fuel to power.

Born in Paris of German parents, Rudolf Diesel attended German schools which gave him a technical education. A brilliant student and engineer, he secured industrial backing for his invention. But his first engine, tested in 1892, exploded, severely injuring him. Not until 1897 was success assured.

The heavy, powerful engine was a natural power plant for ships. It made submarines practicable. Dr. Diesel's familiarity with Germany's development of submarines inspired the rumor that he was killed by the kaiser's agents lest he give too many secrets to England. His fatal journey took place just a year before the outbreak of World War I. Another theory is that the debt-plagued inventor intentionally slipped overboard.

Whatever the circumstances of his death, Rudolf Diesel lives on in the thunder of exhausts on farms, highways, railroads, ocean lanes, and city construction sites.

References—*National Geographic Magazine*, Nov., 1936, "Trains of Today—and Tomorrow."